

# Grading and Drainage Plan

## Terms of Reference

### 1. Description

A Grading and Drainage Plan shows the existing grades on the subject property and adjacent lands, and the proposed grading changes. At a high-level, a functional Grading and Drainage Plan is to show how surface runoff will be controlled with positive drainage and directed through the proposed site to a confirmed legal drainage outlet. For detailed Grading and Drainage Plans, the focus expands to include landscaping around the building(s), soil elevations, and ensures runoff is directed away from the building(s), without impacting neighbouring properties.

### 2. When Required

A Grading and Drainage Plan is required for Site Plan Control, and Plan of Subdivision applications. A functional Grading and Drainage plan is acceptable for the Draft Plan approval, whereas a detailed Grading and Drainage plan is required for the detailed design stage of a subdivision, as well as for Site Plan Control applications.

### 3. Contents

The following information is to be included on Grading and Drainage Plans:

#### A. General Information to be Included on all Grading Plans

- Title block (including name of Owner/Applicant, name and address of firm preparing the drawing, address/legal description of Site, project name, drawing title and number, scale, date of submission, and revision box with all revision dates),
- Key plan showing site location in respect to the City street network,
- North arrow,
- The Plan should have a note that references the horizontal and vertical datums that were used and tied into to complete the project, as well as a note stating the source of the property boundary and topographic information. The drawing should also make reference (on the face of the plan) to site benchmark(s). (For example: Horizontal: NAD83 (CSRS), MTM Zone 9, Vertical Datum: CGVD2013),
- Legend,
- Clear identification of property lines and Right-of-Way limits, including any proposed road widenings, sight triangles and reserves adjacent to the subject property,
- Any easement(s) and to whom the easements are in favour of,



- Abutting roads including the location of all existing surface features (i.e. edges of pavement and shoulders, curbs, traffic islands, utility poles, hydrants, bus shelters, mailboxes, sidewalks, watercourses, ditches, culverts, catch basins, trees). It is acknowledged that some of this information may not be possible to provide on functional Grading and Drainage plans, if using Lidar.
- Existing elevations, contours and/or spot elevations within the project site, along the property boundaries, on abutting public streets, and a minimum 10m within the adjacent properties. It is acknowledged that some of this information may not be possible to provide on functional Grading and Drainage plans, if using Lidar. In that case, contours are sufficient.
- All existing access/driveway entrances to the subject property and the adjacent properties, including those of properties on the opposite side of the road to the subject site.

#### **B. Technical Information to be Included on All Grading Plans**

- Proposed spot elevations and slope gradients are to be provided at critical locations including but not limited to property boundaries, road centrelines, berms, areas where proposed elevations are approaching the grade raise limit, park blocks, and servicing blocks. The following is to be provided where known for functional grading plans but must be provided for detailed grading plans: swales, ditches, proposed retaining wall areas, terracing, and other key grassed areas, if any.
- Centreline roadway spot grades are to be provided at key points along the proposed roadway including intersections, and locations where the direction of runoff generally changes. The following is to be provided where known for functional grading plans and must be provided for detailed grading plans: bends, and middle-points along long stretches of road.
- Proposed major and emergency overland flow arrows following key drainage paths including roadways, grassed areas, swales, ditches, etc. until the legal drainage outlet is reached.
- General stormwater management pond block and pond elevations including water quantity, quality, bottom, berm and freeboard elevations, key stormwater management volumes, as well as grading of sediment drying areas.
- Atypical swale cross sections may be required at the Draft Plan stage if site specific circumstances warrant the information. Detailed plans are to also include typical cross section details of swales proposed.
- Location and information of key surface water outlets, including but not limited to municipal drains,



- Locations of any regulatory flood lines or development limit lines (i.e. setback and slope stability limits).

### **C. Additional Technical Information to be Included on Detailed Grading Plans**

- proposed spot elevations and slope gradients are to also be provided at: more frequent and regular intervals (i.e. +/- 20m spacing) along the roadway centreline, lot grading, terracing along side yards, block grading, vehicle accesses and driveways, ramps, parking lots, edges of pavement, curb lines or sidewalks, and grassed, granular and paved areas. Detailed design spot elevations are to be provided at all high and low points, top and bottom of ditches, top and bottom of terraced slopes, top and bottom of retaining walls, top of grate elevations for catch basins and maintenance holes, building corners, and all changes in gradient.
- Detailed design is to include pond plan and profiles, and access routes.
- Detailed plans are to include the following building elevations: finished floor of the ground floor, building entrances, underside of footings, and top of foundation.
- Where rooftop storage is proposed, detailed plans are to include roof downspout, roof drain and scupper locations and elevations.
- Location and information of all surface water outlets including but not limited to catch basins, headwalls, and culverts. Information is to include direction of flow, size of culverts/pipes, outlet details including material and rip rap.
- For detailed design of rural sites, provide location of septic tanks, outline of tile beds, wells, and holding tanks for firefighting. For subdivision, these locations are conceptual.

## **4. Submission Requirements**

Grading and Drainage Plan must be drawings stamped, signed, and dated by a Professional Engineer, qualified in the Province of Ontario. An Ontario Land Surveyor (O.L.S.) should be engaged when reporting on or relating information to a property's boundaries, legal information, topographic information, and existing conditions.

## **5. Resources / Background**

- For detailed subdivision drawings refer to [Grading Plan](#).
- Ottawa Sewer Design Guidelines
- Ontario Stormwater Planning and Design Manual

